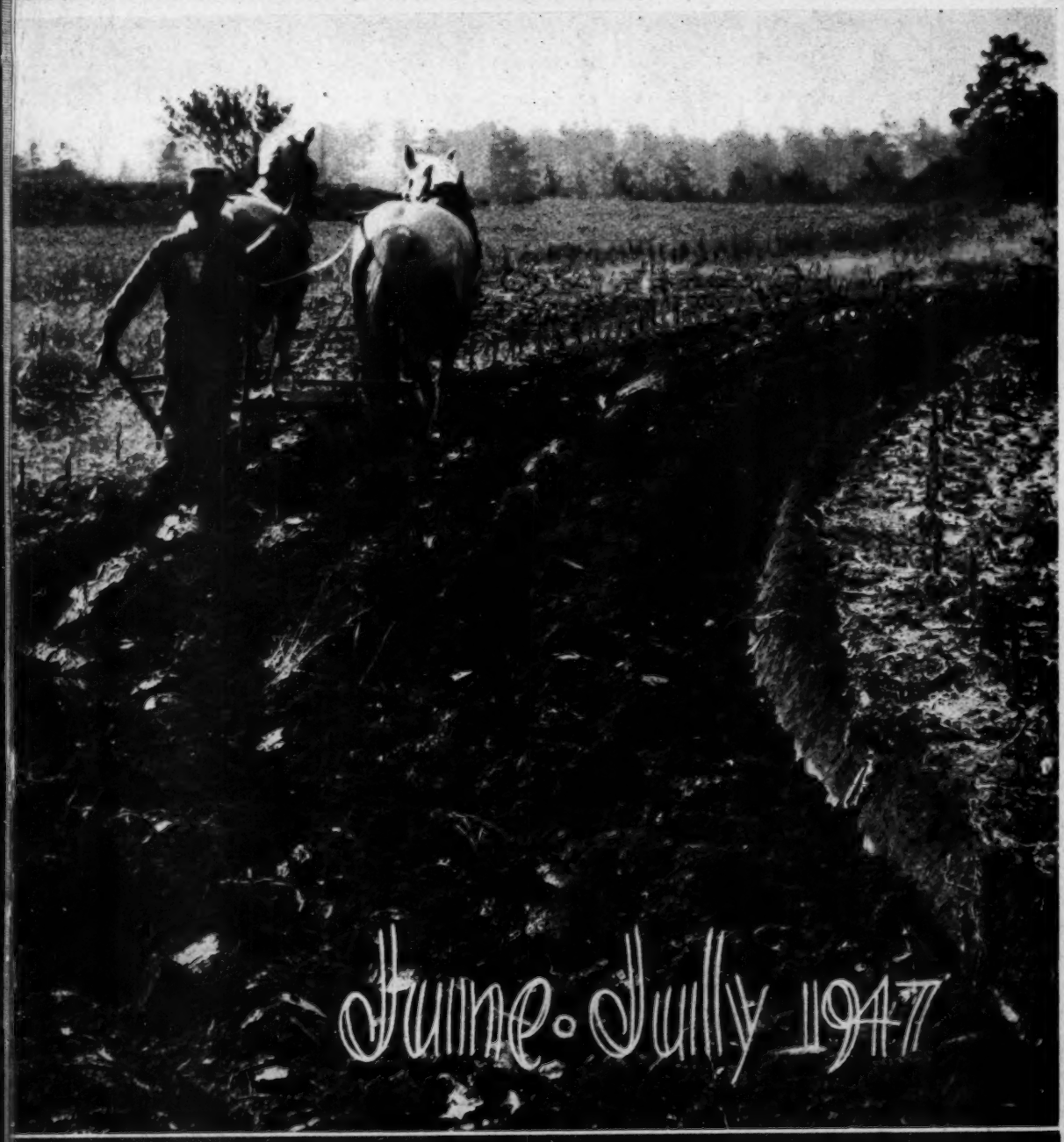

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WELLINGTON BRINK
Editor
Art Work by
W. HOWARD MARTIN

SOIL CONSERVATION is published by direction of the Secretary of Agriculture as administrative information required for proper transaction of the public business, with approval of the Director of the Budget. SOIL CONSERVATION supplies information for workers of the Department of Agriculture and others engaged in soil conservation.

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BURIED CABLES.—With the increasing use of buried telephone cables, the Long Lines Department of the American Telephone & Telegraph Co. has become concerned with the problem of soil erosion. It has prepared a training course in erosion control for its engineering, construction and maintenance forces.

The preliminary training was conducted on a conference basis in Atlanta, Ga., last fall. Trial classes were held in Cleveland and St. Louis in January, out of which grew a standard training course. Thus far, approximately 175 Long Lines employees have been schooled in 13 classes, with more to be trained as requirements demand.

The course is designed to give an understanding of erosion processes, and of controls needed for protection of buried cables. With the selection of cable routes, construction methods, and soil controls best fitted to terrain conditions, the program is expected to result in lower maintenance cost for buried cable and improved conditions for rights-of-way.

The Soil Conservation Service cooperated in developing the course and in teaching the fundamentals of soil and water conservation. It is probable that various divisions of the company will ask individual soil conservation districts for assistance where intensive control measures are required.

—J. S. CUTLER.

FLASH FROM OAK RIDGE!—Explaining his need for SOIL CONSERVATION magazine, E. A. Wende, chief, Department of Public Works, Atomic Energy Commission, writes to the editor:

"In the process of constructing buildings, streets, and access roads in this area, soil conservation practices are required. Part of this improvement by revegetation has been completed, but where grass mixtures have failed to survive, it is necessary to use drainage structures and larger plants.

"Construction programs are scheduled over the next several years and the engineers involved in the work desire to keep informed of advances in soil and water conservation."

THE COVER.—Introducing this issue is a scene which is typical of the new style farming. Caught by the camera of F. L. Hanes, it represents the contour theme favored on so many farms in North Carolina, one of the leading States in the movement toward soil conservation. This farm, operated by P. E. Cobb, is situated near Summerfield. There will be little loss of soil or water from this field.

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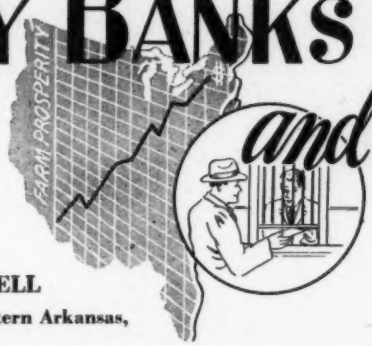
Country Banks and the Land



By W. W. CAMPBELL

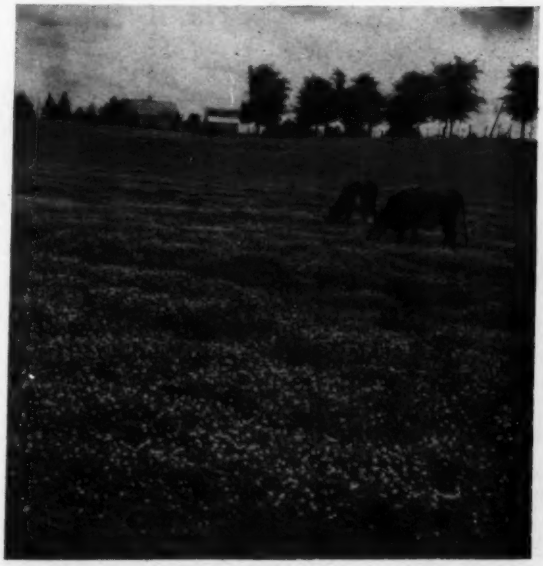
President, National Bank of Eastern Arkansas, Forrest City, Ark.

Poor soil supports poor people. Bankers, of all people, should recognize the benefits that come by having good soil. Proper soil management is not merely a farm problem. The future of many of our towns and cities, in large part, depends upon the maintenance of the fertility and productiveness of the farm lands which surround them. When soil productivity is depleted the farmer becomes discouraged, his standard of living is lowered, and the income of the entire community goes down. People tend today to move away from poor farms, even though we no longer have a new land farther west. Rural communities develop and prosper, or wither and die, as soil productivity goes up or down. Soil productivity determines the trend, and the strength of the local bank measures the results.

The banker, as trustee of local funds, must look critically at this whole problem of soils and farm improvement. With this in mind, the Federal Reserve Bank of St. Louis conducted a series of case studies of the results of individual farm-improvement programs in an attempt to measure returns from investments in sound soil improvement practices. Thus far not a single instance has been found where a complete soil conservation and improvement program was not a financial success.

Soil conservation districts facilitate the job of protecting and improving our productive land. They serve as a medium through which we can all work to do our part of this job.

It has been my privilege to serve as secretary of the board of supervisors of our local soil conservation district since it was organized in 1938. From our experience, I agree with the basic principles announced by the Soil Conservation Service that every acre of land should be used in accordance with its capabilities to produce and every acre should be treated in accordance with its needs; or, to put it another way, a complete program of soil conservation should include (1) sound land use, (2) the right combination of conservation practices, (3) the maintenance and improvement of soil productivity, and (4) economically sound conservation farming.



Edd Hodges, Arkansas farmer, once knew this pasture as a cultivated field creased with large gullies. He sodded it to Bermuda and seeded it to lespedeza, yellow hop and Dutch clover. Dallis grass volunteered. A neighbor's cow, turned in to graze, increased her milk production half a gallon per day within a week.

We have found that we should change from row crops, mainly cotton, to a more diversified

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agriculture. This includes more livestock, more feed crops, more pasture, meadow and woodland, and the use of more land for orchards and cash crops other than cotton. We have found that we need a complete soil conservation program and should not attempt to concentrate on only one or two conservation practices.

This is part of a 200-acre pasture in St. Francis County, Ark., which has been sodded to Bermuda grass and overseeded with lespedeza, white clover, and Dallis grass.

He talks dollars and sense, this banker, W. W. Campbell.

WE HAVE found that applying the right combination of conservation practices pays big returns. I have in mind a farmer who 10 years ago was almost bankrupt. The productivity of his soil had been reduced to where it required 700 acres to produce about 200 bales of cotton. Corn would not yield enough to justify cultivation. Practically the entire production of the farm was going into interest and taxes. Payments on principal were impossible. Today, this man is free of debt and has money in the bank. He is producing 200 bales of cotton annually on 200 acres. He attributes his present circumstances to two things: (1) the adoption of an over-all soil conservation program planned by Soil Conservation Service technicians working in the South Crowley Ridge Soil Conservation District, and (2) the financial support his banker gave him.

I have in mind another farmer who bought a tract of land, including several hundred acres which are too rolling for practical crop production. The land had been overcropped and the steep slopes had eroded so badly you could see a network of gullies. He set out to develop the area into permanent pasture. The larger gullies were plowed in, and the fields were sodded to Bermuda grass and overseeded with lespedeza and hop clover. Today the gullies are healed over, a good stand of grass has developed, and this otherwise useless piece of land is providing an abundance of livestock pasture. Inside this new pasture a farm pond for livestock watering has been constructed. In addition to water for livestock, the pond has been stocked with game fish and is a source of recreation and tasty fish dinners.

I ALSO want to tell you about a once valuable 320-acre farm which through exploitive practices had dropped to a point where crop yields were so low that it was difficult to obtain tenants. Ownership had passed to a mortgage company and the farm was definitely a liability to our com-

munity. Crop yields had declined to an average of 140 pounds of lint cotton and 15 bushels of corn per acre. This land was originally capable of producing a bale of cotton to the acre. In 1939, a progressive local farmer bought the place and put it under a complete planned program of soil conservation. The soil has been improved to a point where, in the last 4 years, yields have run about 550 pounds of lint cotton, 45 bushels of corn, 55 bushels of oats, and nearly 2 tons of lespedeza hay per acre. Pasture production has been stepped up

An Arkansas farm drainage ditch gets the attention of H. T. Barnett and J. E. Terry, technicians of the Soil Conservation Service.

from a maximum of 25 cows for 6 months grazing to where it is supporting 175 mature cows with an abundance of pasture for 9 months out of the year.

The pattern of production has changed considerably. Corn has been reduced from 100 to 60 acres, cotton from 100 to 34 acres. Oats, a new crop on the farm, now occupies 80 acres; lespedeza hay, also new, is harvested from about 100 acres. On the average, 115 acres of bur clover and vetch are grown as green manure crops. The permanent pasture has increased from about 60 to over 100 acres.

It required a sizeable volume of new capital investment to restore this farm to its present level of productivity. New capital input totaled a little more than $12,300 for fencing, building repairs, lime and fertilizer, green manure crops, and pasture development for the 6-year improvement program. While this investment was being made, increased crop production valued at $51,000, at average prices, can be traced to the farm-improvement investments. In other words, an average of $2,050 per year was invested in farm improvement during the 6 years. For this same 6 years, the average increased value of crop production was $8,500 a year. It will require a cash outlay of approximately $1,000 a year for lime, fertilizer, and green manure crops to maintain productivity where it is today. This maintenance outlay will return the operator through increased production of crops and pasture about $7,500 each year. The total value of crops and pasture produced on the farm, at average prices, has been brought up from about $3,000 under the old system to over $10,500 under the present plan.

You will recall that in 1939 farmers did not have the volume of cash reserves they have today. The buyer of this farm was no exception. Without a carefully planned loan program, he could not have financed the purchase of the farm or the badly needed improvements. I tell you with no little pride that our bank furnished the credit that was necessary. The results have been a source of great satisfaction to us. These figures which I have just given tell you better than anything else that I could say how quickly the credit was retired from profits directly traceable to the improvement investment.

To introduce a soil conservation program on a farm involves a capital investment. The size varies with the individual farms. The solid results, in terms of increased income which are shown by the records available from many farms, prove that such investments pay for themselves and therefore provide a basis for the sound extension of credit. Since soil conservation practices add to the productivity of the land, the land itself should be the security for the loan. This is sound because good soil is essential to good farm credit. The manner in which the farm is operated means as much as the value of the land when the loan is first made.

Loans for carrying out soil conservation practices on a farm should be made only after an overall, long-time conservation plan has been worked out. Drawing up such a plan is a highly technical job. Farmers generally do not have the technical ability to do it for themselves and must rely upon assistance from outside. It is important for banks to be sure that the plans are properly drawn. With

increasing numbers of agricultural areas having organized soil conservation districts, the services of technicians of the Soil Conservation Service are available to farmers. A farmer who requests a loan to carry out conservation practices should have such a plan in mind, understand how it will work on his farm, and have the ability and the initiative to carry it out. Special consideration should be given to the individual when making a conservation loan.

CREDIT terms for a soil conservation loan should be flexible. On some farms the soil conservation plan will call for practices such as liming, the growing of soil improving crops, fertilizing, and the use of good crop rotations which, comparatively speaking, would not involve unusual costs. Increases in incomes from such practices pay for them within 1 to 3 years. On other farms the soil conservation plan may require such practices as terracing, digging drainage ditches, and building farm ponds which require considerable cash for a year or two. It will probably take several years for such practices to pay for themselves from increased returns, but as soon as they are installed the appraisal value of the farm increases proportionately. In such instances you have a sound basis for reappraisal. The reappraisal can be made by adding the total cost of the capital items going on the land as a result of the conservation program to the appraised normal value. The reappraisal on this basis is certainly a good business practice and it enables a bank to maintain a sound margin of security while advancing credit for conservation farming.

On still other farms it may be desirable to retire some of the cultivated land to pasture or meadow. A loan may be extended, first, for fencing, seeding, fertilizing, and other costs to establish a good pasture or meadow. Then, within 2 or 3 years additional help may be required to buy livestock to utilize the pasture. Again it may take several years for increased incomes to pay off the investment for conservation farming. A combination of one or more of these conditions may exist on the farms that you deal with.

THERE are some areas in many communities where soil depletion is so far advanced or the soil is so low in fertility that it may not be economically sound for the individual farmer to attempt to install adequate conservative practices. It could be that the size of the farm is too small to be an economic unit when a conservation program is adopted. In making conservation loans, bankers must be alert to such situations and not attempt to finance programs that involve such obvious economic risk. The bank's best protection against such circumstances is to consider carefully the soil conservation plan for the individual farm involved, and figure on the basis of conservation estimates of increased incomes expected, based on what has been accomplished on other farms where similar practices have been carried out.

If properly planned, soil conservation loans offer a type of farm mortgage financing in which the real value of the security will be increased while the principal indebtedness is being reduced. Credit extended on this basis should be a constructive development from the standpoint of the borrower, the lender and the community.

We can assume that you are making a capital loan on a 100-acre farm that has just been cleared for cultivation, which extends for several years. Under the usual farm mortgage, the borrower is at liberty to follow operating programs that may be disastrously destructive to the soil resources of the mortgaged farm. As long as the borrower makes the required annual payments on his loan, there is little the lender can do to prevent undermining the very basis of his security. If something happens that makes the annual payments more difficult than expected, such as lower prices or adverse weather conditions, the borrower may be encouraged to deplete his soil resources much faster than ordinarily expected in an attempt to meet the payments. The security value may decline more rapidly than the unpaid principal on indebtedness is reduced. This has happened many times in the past. In fact, most farm mortgages do not include a clear-cut plan for proper maintenance of the soil resources. A soil conservation loan could prevent the farm from becoming a bad risk. If enough farms in the community are protected, it might prevent the entire community from becoming a bad risk. When enough farms are destroyed in a locality, the community is damaged and of course bank credit weakened. Bankers stand to lose as much, or more, than anyone.

IT SEEMS to me that the rural banker can logically assume leadership and appoint himself a committee of one to push an organized program of soil conservation in his community. Many bankers

throughout the country have individually inaugurated such a movement and the results speak for themselves. Unfortunately, however, the number of bankers who are thus active constitutes a rather small minority of the country banking group. I think the time is ripe for a general well-organized "back to the soil" movement for bankers. You are all familiar with the outstanding results accomplished in the field of agricultural development by such country bankers as our own Bill Bailey at Clarksville, Tenn., and many others. I shall not take time to recount the success of his program or the successes of the other individual bankers who have already waded into the problem. What we need is a program to make Bill Baileys out of every country banker in the South.

The challenge is here and with the challenge comes a marvelous opportunity. The oppportunity is at least threefold:

1. The opportunity to contribute to a stronger and more stable community.

2. The opportunity to build goodwill and larger totals for your bank.

3. The opportunity for sound investment of bank funds at reasonable rates.

The movement is on. Banker interest in soil conservation is high and growing. The ABA through the Agricultural Commission has outlined suggested programs that are excellent, but they are ineffective unless someone puts them into practice. Many of the agricultural committees of the State banker associations have developed outstanding programs for the soil such as awards for outstanding accomplishments in soil conservation. Such devices have proved very helpful in Oklahoma, Arkansas, and other States. At one meeting in Arkansas 23 awards were made to farmers from 3 counties. The event supplied a 6-page write-up in a recent issue of The Arkansas Banker. And yet, the full impact of banker influence in soil improvement will not be felt in the South until every country banker takes it upon himself to take part in the movement. Then, and only then, will the full pressure of organized bank effort be felt on the soil.

Bankers should be well enough informed to advise on problems of soil conservation or be able to tell farmers where to go for assistance. They should visit with their farm customers on the land and discuss the soil conservation practices that may be needed or that have already been installed. A word of encouragement from the local banker counts heavily with farmers and can be very effective in directing them into better farming practices. Through civic organizations and in other ways, the banker is in an excellent position to interest business and professional men, school teachers, and ministers.

I think the entire South is on the threshold of amazing economic developments in which great changes will be wrought in our systems of farming. It is a challenge to us as bankers to facilitate rather than to impair the progress of much needed changes in the rural economy.

In closing, may I repeat again that this whole matter of soil conservation, soil improvement, and farm diversification is a challenge and at the same time one of the greatest opportunities that has ever come to country bankers for constructive leadership in their communities. I have great faith in the good common sense of country bankers. I believe they will do the job.

DISTRICT REPORT.—Supervisors of the Limestone Valley Soil Conservation District in northwest Georgia don't believe in hiding their light under a bushel. They gave wide distribution to their 14-page copiously illustrated report for 1946.

Copies were sent to Senators and Congressmen representing the district, the Governor, members of the State Soil Conservation Committee, the Commissioner of Agriculture, the director of Vocational Education and heads of all agricultural agencies and other key people in the State, and to all agricultural workers, vocational agriculture and G. I. teachers, county officials, editors of newspapers circulating in the district, and all district cooperators.

Other copies went to the Secretary of Agriculture, Chief of the Soil Conservation Service, regional conservator, regional division chiefs, zone conservationists, land utilization project conservationists in the Southeastern States, State conservationists of Georgia and Florida, the local flood control staff, and chairmen of boards of supervisors of other soil conservation districts in Georgia.

C. H. Brand, of the Soil Conservation Service, presented copies of the report to the 150 persons attending a meeting of the Chamber of Commerce and Agricultural Club of Canton, Ga. Similar distribution will be made to civic clubs throughout the district when the supervisors meet with these groups.

When Chairman Gregory attended the meeting of the National Association of Soil Conservation District Governing Bodies in Chicago in February he gave copies of the report to delegates from the 45 states represented.

Foundation Sponsors Contest

Dr. Albert Bregendahl, consulting chemist, watches Ruth Williams run a test of soil taken from a plot entered in the contest.

By LESTER C. FOX

From the ground you see only a small part of the land at a time. The view is from eye-level, and you have long been accustomed to it. But from the air you can take in hundreds of square miles at a glance. You can see what is happening to the land—the bald places in the field where the topsoil is gone and the gullies that look like ugly scars.

For 18 years Lloyd Noble of Ardmore, Okla., has been getting a bird's-eye view of the land as he has flown about the country looking after his drilling contracting business. His flights have taken him from the oil fields of Michigan to the Northwest Territory within 70 miles of the Arctic Circle, over the prairies of southwestern Texas and New Mexico, and to the Atlantic seaboard. He has been disturbed by the soil erosion he has seen. He realized what the bald spots and the gullies meant. He knew that wind and water erosion were taking from the land its ability to produce. He began to wonder what he himself might do to change the picture, for he knew first hand that as the land declines the welfare of the people who live on it and depend on it also declines.

Note.—The author is information specialist, information and education division, Soil Conservation Service, Fort Worth, Tex.

Years before, Noble's father, the late Samuel Roberts Noble, had felt the effects of soil erosion. His thriving and extensive hardware business in Ardmore went on the rocks when his customers were unable to pay for the supplies and implements they had bought on credit. Old timers say that 50 years ago Ardmore was a leading inland cotton market, handling 54,000 bales in its peak year. Now the figure is down to 300 bales.

"That's what soil erosion does to the farmer and the businessman," Noble comments. "Trying to farm eroded and depleted land, the farmers did not have enough income to maintain themselves properly, much less pay for the things they needed to operate their farms. That is what made our so-called Okies—people who were gradually starving as their land moved out from under them to the point where they had to look for some other means of subsistence."

Looking down from his airplane on the general pattern of erosion, Noble decided to do something. So Noble created the Samuel Roberts Noble Foundation in memory of his father, and turned over its affairs to a board of trustees, of which he is a member. While the trust agreement permits the Foundation to work in science, literature, education, and religion, it was Noble's conviction that the first concern should be for the conservation and improvement of soil, the Nation's basic resource.

The Foundation has begun by encouraging soil conservation and improvement in Carter County,

of which Ardmore is the county seat, and Love County to the south. Managing trustee is Francis J. Wilson, West Point graduate and retired colonel of the United States Army Corps of Engineers. He has a staff of a dozen laboratory analysts and field men. Cooperating with the Foundation are various publications, organizations, and agencies, including the Soil Conservation Service.

To create immediate and widespread interest, a $15,000 3-year cash contest has been started. The work of the Foundation during the contest will probably involve more than $100,000 additional expenditure. The contest has three divisions: Improvement of cropland and establishment of permanent pastures for adult competitors; cropland improvement for competitors 18 years of age or under; and garden growing. While the first 2 divisions are spread over 3 years, there will be not only the final prizes but yearly cash awards for progress. Prizes in the garden contest will be awarded annually. Ten-acre tracts are used in the main senior contests, with 2 of the 10 set aside as a check plot. Progress prizes will be awarded each year on the basis of soil conservation, soil improvement, increased production, and the cost and practicability of the methods. In the junior contest, one acre is used, with three-quarters treated and one-quarter untreated. Gardens are half an acre in size.

Entries closed February 1 with 357 contestants signed. As each farmer entered the contest, Foundation field men inspected his entry tract and took soil samples for analysis in the special laboratory set up in Ardmore by Dr. Albert Bregendahl, who has been employed as consulting agricultural chemist. On the basis of field inspection and chemical analysis, recommendations are made as to land treatment. The contestant, however, need not necessarily follow the recommendation.

Though primarily in the drilling business, Noble also knows farming. His mother and father were reared on farms in New York State. During his residence in Ardmore his father kept in close contact with farming through his business. His mother is one of the Foundation's trustees. Lloyd Noble himself is directly interested in agriculture, as owner of a number of farms and ranches in Oklahoma and elsewhere.

"On the farms will be found our greatest bulwark against dictatorship," Noble declares. "The man who feels secure enough to be without fear has an independence of spirit against which dictators cannot progress. This feeling is evidenced more by men who understand their land and its potentialities than by any other economic group. During the last few decades we have witnessed a movement away from the farm in many areas. If this trend is to be reversed, it is essential that we use the most effective known means to check erosion, as well as restore the productiveness of our depleted farms. Only then can we have confidence in the security of the government that our forefathers planned."

Noble believes that all of the world's troubles can be traced to fear, selfishness, and lack of understanding. It is his conviction that "aside from the acceptance of a sound religious philosophy, nothing can contribute so much to the solution of all these problems in every country as an increase in the number of people who, understanding their soil, have through it acquired confidence in themselves and a cooperative feeling toward their fellowman.

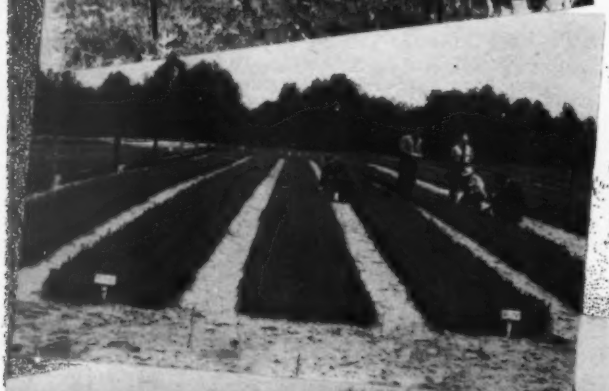
"Within the limits of its field of operations, therefore, this Foundation hopes to accomplish results that will help free the people of fear, reduce selfishness, and attain a better understanding among men."

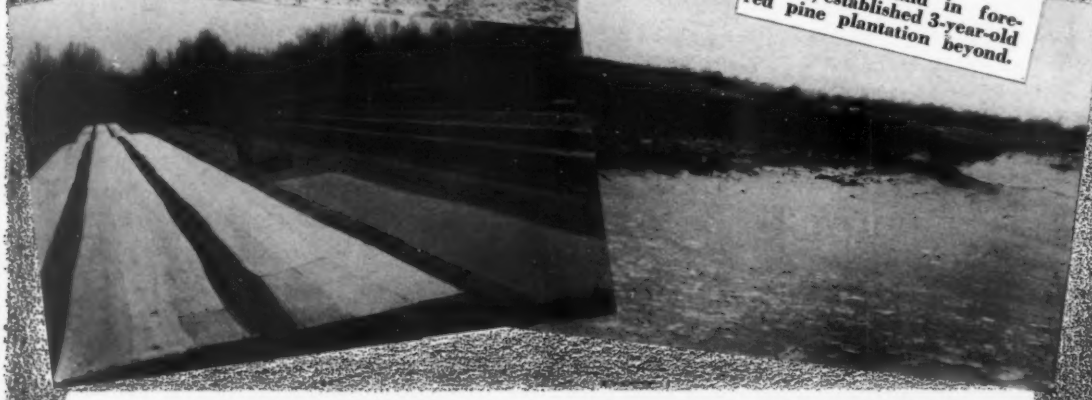
It is the hope of the trustees that the land improvement accomplished through the Foundation's work will inspire others to undertake similar projects, and thus help speed up the conservation of soil resources throughout the Nation.

Lloyd Noble, advocate of land improvement, listens at his desk to the ideas of Col. Francis J. Wilson, managing trustee.

SOIL CONSERVATION DISTRICT

Tree Nurseries





THE PICTURES

At top, Victor Anderson, district director, and a big sign welcome visitors to the nursery.

At left, examining 2-year-old red pine seedbeds at the nursery operated by the South Muskegon Soil Conservation District.

Lower left, seeding has just been completed and ground is being rolled.

Below, blow sand in foreground, established 3-year-old red pine plantation beyond.

By JOHN W. KELLER

SOIL conservation district cooperators need 200 million trees annually. Sixty million are in sight for 1947. Can soil conservation district nurseries help meet the larger demand? Are district nurseries practical or must they be copiously subsidized with money, equip-

ment, and materials? Can they be entirely depended upon to produce a regular annual output of both seedlings and transplants? To get the answers to these questions, I spent a few days in western Michigan studying operating district nurseries, talking with Soil Conservation Service personnel, soil conservation district directors, county agents, and nursery managers, and checking both nurseries and percentages of establishment of plantations.

The district tree nursery movement began in Michigan, where 16 soil conservation work groups now are operating 21 tree nurseries. Although the first nursery was established 8 years ago, the idea has not spread to other States. Yet the nurseries are highly successful, and a tribute to the foresightedness of the soil conservation district directors who anticipated their tree-planting requirements and used this method to meet them.

The first district tree nursery was started by the West Ottawa Soil Conservation District in 1938 soon after the district was organized. Almost 5 million seedlings and transplants have been purchased by district cooperators from the nursery. It comprises 20 acres of land owned by a soil conservation district director and leased to the district for $1 per year. The second nursery was started by the South Muskegon District on about 9 acres. This area also is owned by a district director, and leased to the district. Almost 5 million forest tree seedlings and transplants from this nursery were planted by cooperators.

The ability of the nursery manager seems to be the key to success. If the district is fortunate in getting a man who is thoroughly interested in soil conservation, who understands how plants grow, and has good practical business ability, the nursery can be depended upon to produce good planting stock. In each of the three nurseries which I visited the nursery manager receives an hourly wage from the district while on duty and is responsible for all nursery operations. He makes up the pay roll and directs the work of the laborers who also are paid by the hour. At the peak of the season, none of these nurseries employed more than six laborers. The nursery manager collects the money for the sale of trees and turns it over to the soil conservation district treasurer once a week during the shipping season. He hires laborers and together they prepare the soil, sow the seeds, line out seedlings, operate the overhead water system, attend to weeding, fertilize the soil, cultivate and protect the tender young trees. The nursery manager is responsible for carrying out all of the many duties of his job.

In the fall of the year, the manager takes inventories, sends them to the district office where a return postcard is sent to each district cooperator whose farm plan includes tree planting. This postcard lists the species available for shipment during the next planting season and requests the cooperator to fill in the number and kinds of trees he will need on the return card and mail it to the district office. The manager, with limited assistance, digs, counts, bundles, heels-in the trees, and advises the cooperator when to call for his trees. The distance from the nursery to all cooperators in the district is short and usually the cooperator will bring a box and, if necessary, burlap bags so that there are no packing and transportation charges for the nursery to pay. The cooperator signs a form, agreeing to plant his trees for a forest crop.

The following policy governing the planting of trees from the district and SCS nurseries was adopted by the board of directors of the West Ottawa Soil Conservation District:

1. All plantings made will be of a mixture of two or more kinds of trees. One-half of the trees planted will be for a permanent forest, while the remaining half will be trees which will be thinned out later to improve the stand. The trees thinned out can be used for Christmas trees, pulpwood, and fuel wood.

2. All landowners within the boundaries of the district must become cooperators of the district before they can obtain trees from the district nursery. Occasionally the district will receive free trees from other sources which it may furnish free to district cooperators. These will be furnished in the same proportion as such free trees are to the total amount needed.

3. All landowners within Ottawa County, but not within the district, can purchase trees from the district, but are not entitled to any free trees (grown in SCS nurseries) from the district.

4. All trees must be planted for a forest crop, windbreaks, wildlife food or cover, and they will not be planted for ornamental plantings or resold with the roots attached, nor for planting within incorporated limits of cities or villages, except

NOTE.—The author is Assistant Chief, Forestry Division, Soil Conservation Service, Washington, D. C.

where an erosion problem exists or where the land to be planted is part of an operated farm.

5. All trees obtained from the district must be planted on lands in Ottawa County.

6. All plantings must be protected from fire and grazing damage.

Some believed district tree nurseries had to be highly subsidized. This is not so. The county supervisors provide an appropriation of from $1,000 to $1,500 annually for soil conservation districts for district activities. A part of this appropriation is used for nursery operation. In some cases a used tractor, an old truck, or a transplanting machine has been supplied by the Soil Conservation Service. Technical assistance is furnished to the nursery manager by the work unit leader or a farm planner. This assistance, together with the office record keeping and all other details in connection with a nursery, is reported to average less than 2 weeks of a technician's time throughout the year. It never exceeds 3 weeks annually and no technical assistance at all is furnished by the farm planner to the South Muskegon District nursery. Those in charge of the soil conservation district office report that the office handles the nursery records and all other office work along with the regular district work, and that this is not a difficult job even during the busy shipping seasons.

The records of the West Ottawa Soil Conservation District nursery show that the district planted over 11 million trees up to June 30, 1946. Of this number over 5 million were purchased by district cooperators from the district nursery. Five million came from the Soil Conservation Service nurseries and 341,668 trees were grown in small farm nurseries of district cooperators. The remainder of the trees planted in this district were purchased from other public or private nurseries. The need for trees in this district is so great that district cooperators are urged to grow their own trees both in seedbeds and transplant beds.

Much of the credit for the success of the district nursery movement goes to farm agricultural agent B. R. Arnold. Mr. Arnold is not a forester but was largely responsible for the district tree-growing program. The success attained seems to take much of the mystery out of the forest tree nursery business. The records show that during the spring of 1946, 286 cooperators planted 690,000 trees grown in the district nursery and furnished in lots of 100 to 12,000. Red pine heads the list in number planted. This is followed by white pine, jack pine, pitch pine, Scotch pine, Norway and white spruce. Scotch pine and spruce are used mostly as thinnings for Christmas trees, so that the cooperators receive an early return from their plantations. During the first few years of operating district nurseries, both seedlings and transplants were planted in the field. Now it is agreed that transplants give the best results and practically all of the trees planted are transplants. Both 3- and 4-year-old transplants are used with the latter preferred.

Trees from the district nursery are sold to district cooperators for forest planting within the district at $5 and $7.50 per thousand for 2- to 4-year evergreen seedlings and transplants. The original price of trees to cooperators was $3 per thousand, but this had gradually been raised because of higher labor costs. Usually district-grown trees are cheaper than those grown in other nurseries. In 1946, evergreens grown in other public nurseries cost $8 to $10 per thousand. Due to the low inventory of nursery stock in other public nurseries in Michigan, sales were limited in 1946, to 1,500 trees of a single species and 4,000 trees of all species to any one person. In addition to the nursery cost for trees, there must be added the packing and transportation charges f. o. b. the nursery, which is the total cost to the planter. The low prices for district-grown trees are possible because of low nursery operating costs. Workers are paid only when they work. The land is leased by the district at a nominal cost, or in some instances, is owned by the district. The nurseries studied are remarkably free from weeds due to the soil treatment and care, so that weeding is a minor expense. All these procedures help keep down the cost of trees to cooperators.

A total of 50,000 out of the 238,000 acres of land in the West Ottawa Soil Conservation District must be planted to trees primarily for stabilization of sand blow areas. It is believed that this job cannot be done in time to save the soil with the limited number of trees that can be had from the Soil Conservation Service, the two Clarke-McNary nurseries operated in the State, and the privately operated tree nurseries. If the job is done, before a lot of the soil is blown away, the district nurseries must furnish a large part of the stock. But even if trees were available from other sources, the big advantage of district nurseries are (1) freshly dug

Olaf Hostad, who serves the South Muskegon Soil Conservation District in dual capacities as chairman of the board and as nursery manager.

planting stock which results in better survival, (2) availability of trees at proper times for planting, and avoidance of transportation troubles, (3) the educational value—the nursery belongs to the local people.

The pay-off comes with the high percentage of survival from trees grown in district nurseries. Representatives of the Extension Service, the Soil Conservation Service, and the soil conservation districts agree that the establishment with district nursery trees exceeds 90 percent and frequently reaches 95 percent. Checks of plantations show almost all trees growing. This high rate of establishment is possible because of the short time the trees are out of the ground, the short haul from nursery to planting site, and the absence of the usual packing and shipping hazards.

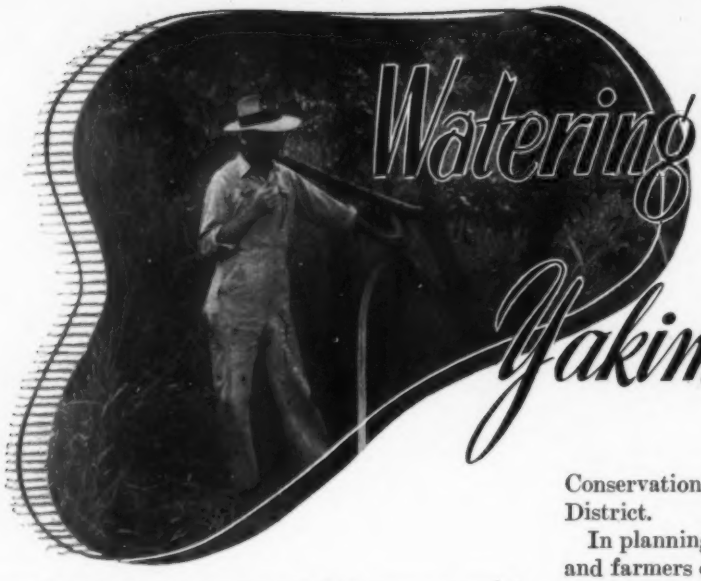
The three nurseries visited show conclusively that district nurseries are (1) highly successful, (2) that they can be operated without high subsidization, (3) that they can produce both seedlings and transplants at low prices, and (4) that results from planting are much better than those from trees produced in distant nurseries.

School forests and woodland marketing cooperatives are two means of encouraging tree planting within the district. These are novel ideas, both of which mean more business for the district nursery.

The South Muskegon Soil Conservation District boasts 30 school forests; the West Ottawa District 19, and the North Muskegon District 12. Size varies from 40 to 160 acres, the average being about 80 acres. Students, under the guidance of regular teachers, plant thousands of trees annually that are furnished free by the district nursery. The Holland School Forest is an excellent example. In its 12 years of operation, students have planted almost 100,000 trees. Some now are over 16 feet tall. More than $500 worth of Christmas trees cut in thinning operations from this school forest were sold during the 1945 Christmas season. The funds were used to buy more land to enlarge the school forest so that the students can plant more trees from district nurseries. The Holland school has constructed a very fine log cabin in its forest. Provisions have been made for preparing hot lunches and sheltering the tree planters. Near the log cabin are forest tree nursery seed and transplant beds that have been planted and cared for by students. Here they are taught to grow their own trees, care for them, and transplant them in the field.

The West Ottawa Cooperative Marketing Association was formed to encourage conservation practices in marketing woodland products. To date, most of the work of the association has been in the marketing of Christmas trees from plantations. District cooperators are instructed what trees to remove for Christmas trees without harming the plantations.

The Michigan story can be duplicated anywhere in the United States where soil conservation district directors can give to tree nurseries the attention that is requisite.



Watering Orchards in the Yakima Valley

Cecil Clark (above) operates sprinkler system in peach orchard from standpipe located at base of tree out of the way of tillage operations.

By ALLAN W. McCULLOCH and TED BOWMAN

THE STATE of Washington produces approximately one-sixth of this country's apple crop. Peaches, apricots, cherries, and grapes are also important fruit crops. Except for small areas, all of these fruits are irrigated.

Because of favorable climatic conditions, a high percentage of the fruits are grown on moderately sloping to steep lands. Being on sloping lands, the soils are generally limited in depth.

Furrow irrigation, straight down the hill, except for minor acreages, has been the only method of irrigation of these lands. Even with the best of care, the soil washes. Distribution of water between the upper and lower parts of the orchard is poor. The top gets too much water while the bottom suffers from having too little.

In the Yakima Valley, fruit growers, as well as other farmers and ranchers, met their erosion problems by organizing five soil conservation districts in rapid succession: Ahtanum Soil Conservation District, East Benton Soil Conservation District, Hi-Land Soil Conservation District, Roza Soil Conservation District, Wenas Soil Conservation District.

In planning their programs, district supervisors and farmers of the districts pointed out the major need for improved irrigation practices.

Sprinkler irrigation is the ideal method of applying water to sloping lands. You can design the system to get very even water distribution to all parts of the orchard. Also, you can apply it like a gentle rain, so that the soil takes it all in. Then when the soil reservoir is full, you shut it off.

It takes some careful planning, however, to be assured that the sprinklers will give these results on all types of soils and still be within production-cost limits.

Technicians of the Soil Conservation Service working with the soil conservation districts in the valley have taken this approach. They contend that sprinkling must be well planned and sufficiently economical to become an established practice.

To date, 18 systems have been planned as part of complete farm conservation programs in the Hi-Land Soil Conservation District; 5 in the Roza Soil Conservation District; 37 in the Wenas Soil Conservation District; 2 in the Ahtanum Soil Conversation District; and 5 in the East Benton Soil Conservation District. Each system is designed to fit the soil's intake and moisture-holding capacity and provide plant moisture throughout the season.

Two brothers, Cecil and Ted Clark, in the Roza Soil Conservation District, have installed sprinklers on 80 acres. They are going ahead as rapidly as they can get the materials on their remaining 340 acres of peaches, cherries, apples, and pears.

NOTE.—The authors are, respectively, head, regional irrigation section and district engineer, Soil Conservation Service, Portland, Oreg., and Yakima, Wash.

Careful head control to individual furrows in a mature peach orchard. Six hundred furrows are irrigated with 1.0 second-foot flow of water. Note good cover crop which is combined with good irrigation practices to eliminate erosion on the Cecil Clark property.

Clark says he has completely done away with soil washing, uses less water, and obtains higher yields. His spraying and harvesting operations have been made easier and more efficient with the elimination of furrows in his orchards.

Paul Dodge, located in the Moxee area of the Ahtanum Soil Conservation District, has a complete farm plan for his 72 acres of new irrigated land. If surface irrigation methods were used he would have water sufficient for only 52 acres. Now, with a properly designed sprinkler system, he will be able to irrigate the full 72 acres and will be assured of a good cover crop on lands which would otherwise erode for several years.

On the Harold Dobe farm in the Wenas Soil Conservation District, 1½ acres were sprinkled

last year. Serious erosion was halted, water was saved and production increased. Dobe now is going ahead with plans to put the entire 80 acres under sprinkler irrigation next spring and will establish a permanent cover crop at the same time. A good portion of Dobe's farm was eroding badly last year.

Leo M. Hansen, in the Ahtanum Soil Conservation District, put 18 acres of seriously eroding orchards under sprinklers this year. Under surface methods Hansen had neither the water nor the time to cover all of his orchards. On this tract are wide variations of soil types. This season Hansen was able to irrigate the entire area with sprinklers without erosion. A schedule was worked out, varying the time that the sprinklers were operated on the several soil types, as a part of his conservation farm plan. Not only has soil erosion by irrigation water been completely eliminated, but an average of 30 percent of the water used by furrow methods has been conserved.

A new crop is being sprinkled in the East Benton District. On the Rollo Lanning farm, 0.2 acres of Concord grapes was sprinkled this year on a trial basis. The results are very satisfactory to date and promise to provide information required to extend this practice to a large acreage. This trial will be continued in 1947.

"Contour" or controlled-gradient irrigation of hillside orchards and vineyards on favorable sites is another conservation irrigation method used in the area. In the Roza Soil Conservation District 8 acres of this type of irrigation were laid out in the spring of 1946. An additional 50 acres is planned for 1947.

Even on gentle slopes where downhill furrows can be used, conservation irrigation is needed. The length of the furrows and the head turned into them must be adjusted to prevent erosion or over-irrigation with its resultant drainage and alkali problems.

Good cover crops not only help maintain soil fertility and control erosion, but also play an important role in providing the soil with the means of taking in irrigation water.

On the orchard lands of Washington and on other irrigated lands of the West, conservation irrigation is bringing about a new era in irrigated agriculture.

Five Years of Soil Conservation Biology

By WALLACE L. ANDERSON

SEVENTY-FIVE percent of the farm conservation plans of the Upper Mississippi Region (Wisconsin, Minnesota, Iowa, Illinois, Missouri, Michigan, Indiana, Ohio) now call for the establishment of practices particularly beneficial to wildlife. These are in addition to changes in land use, crop rotations, pasture improvement, woodland management and other conservation measures helpful to wildlife. This shows progress. Five years ago there were fewer than 2,400 farmers who had prepared farm conservation plans in 53 soil conservation districts, in the Upper Mississippi Region. On July 1, 1946, more than 45,000 farmers in 353 districts had applied, or were in the process of applying, complete farm conservation plans on 7,157,000 acres of land. The number of plans is now 18 times what it was 5 years ago.

In 1941 there were about 2,300 acres planned specifically for wildlife use. Five years later 57,500 acres had been planned for wildlife.

Strip cropping, a practice known to double the number of ground-nesting birds, was applied to more than 500,000 acres of cropland during the 5 years.

Although labor was scarce, farmers in soil conservation districts did an outstanding job of tree planting. During the war years they planted more than 32,000 acres of trees and shrubs in odd areas, gullies, shelter-belts and on eroded areas being converted to woodland.

In a day and age when fence-rows are not looked upon with favor by many farmers, cooperators in soil conservation districts in the southern part of the region received enough multiflora rose to plant more than 200 miles of living fence. Thus, the modern fence-row becomes a part of the wildlife community on well-managed farms.

Streambank management—useful for erosion control and valuable for wildlife—was limited because of the large amount of labor and materials required. Even so, farmers in soil conservation districts applied the practice to more than 2,500 acres, which represents about 625 miles of protected streambank.

The number of farm ponds constructed by farmers jumped from 200 in 1941 to 5,700 in 1946. These are not "water holes," but properly designed ponds, fenced to exclude livestock and, in most cases, are further developed for wildlife by plantings of legumes, grasses, shrubs, and conifers. Water from these ponds is usually piped to a tank outside the pond area to supply livestock. More than 2,200 of these ponds were stocked with palatable fish supplied by the United States Fish and Wildlife Service and State conservation departments.

Soil conservation district governing bodies are showing more and more interest in the wildlife aspects of soil conservation. So are other public agencies. Seven State conservation departments are supplying planting stock to farmers. One State has gone into large-scale production of multiflora rose. A State university and a State conservation department have started pond management studies in cooperation with districts. Two States are cooperating with soil conservation districts in carrying out Pittman-Robertson development projects. In another State, the extension biologist is working closely with districts.

Several colleges, universities, and conservation departments are cooperating with soil conservation districts in the region on marsh management studies, streambank erosion control projects, submarginal land purchase, fence-row studies, educational work, and similar activities. Thus the soil conservation district proves an effective vehicle through which farmers and various State and Federal agencies can work together to increase farm wildlife and contribute to a vitally necessary soil conservation program.

Sprinkler IRRIGATION OF GRAPES

Section of vineyard where sprinkler demonstration was conducted. Main line from pump appears in background between first and second rows. Lateral with sprinkler heads can be seen on top of fourth row. Data was taken on five rows which included two on each side of lateral. Conventional furrow method of water application was used on the rest of the vineyard.

BY OTTO F. SCHNELLHARDT AND LINN L. TINSMAN

THERE are many places in the State of Washington where the planting and growing grapes on steep, very sandy or shallow soils would be feasible and practical were it not for the fact that rill irrigation causes overuse of water and presents an erosion hazard. This has led to many requests for information on this type of irrigation being received by technicians of the Soil Conservation Service of Kennewick.

Sprinkling of vineyards seems not to have been tried on a commercial basis in Washington. It was tried, however, on an experimental basis on a 2-acre vineyard in 1946 by the Wenatchee Tree Fruit Experiment Station. The report was favorable.

Rolla Lanning presses button to start sprinkler. Small meter under switch measures current consumed. That's Lanning's daughter, Blanch, eyeing the operation.

Some sprinkling of vineyards was done in California also, but there is danger from mildew in the more humid areas. Less danger of this sort was observed in California where the grapes were

NOTE.—The authors are work unit conservationists with the Soil Conservation Service at Yakima and Kennewick, Wash.

sprinkled, and the foliage and fruit allowed to dry before sundown. In the dry climate of Central Washington there would probably be less likelihood of mildew. And frequent winds would tend to dry grapes rapidly.

Grape growers are reluctant to try sprinkler irrigation because of such hazards as scalding, cracking, shattering of young clusters and other mechanical or disease injuries. Obviously, there was an urgent need of an improved method of irrigating grapes on steep, sandy, or shallow soils. It was decided to find out if sprinkler irrigation could be used under these conditions.

During the spring of 1946 contacts were made with various implement companies, individual grape growers and others interested in sprinkler irrigation of grapes. Rolla Lanning, who lives 5 miles southeast of Kennewick and has a farmer-district agreement with the East Benton Soil Conservation District, was interested in working out this problem. His sandy soil is planted to grapes. Lanning agreed to furnish an area of mature Concords for the demonstration.

Implement companies in Seattle and Pasco agreed to furnish the pump, motor, pipe, and sprinkler heads. An electric power company offered to furnish poles and wire to the pump site. The help of research workers of a grape juice company at Kennewick and of the Soil Conservation Service at Prosser was also invoked. It was late July before all equipment had been delivered and installed. The first sprinkling was started August 2. Previous to this time the grapes had been irrigated by the rill method. The test area consisted of five rows of grapes 160 feet long and 45 feet wide for the coverage of one lateral of sprinklers.

It is realized that the 1946 observations are very incomplete. They will be continued throughout the 1947 irrigation season to get more information on the effect of sprinkling during an entire season. The results from the preliminary observations, nevertheless, are very encouraging. Apparently there was no damage to the fruit, foliage or vines by the use of overhead sprinklers. The sprinkled area tested 2 percent higher in sugar content and the production on this area was equal to that of the rill-irrigated area. This higher sugar content may have been due to other factors than sprinkling.

Apparently the grapes were not damaged by overhead sprinkling at any time. There was no scalding of fruit, foliage, or vines. The fruit did not crack or shatter. It remains to be seen if there will be any ill effects from an entire season's sprinkling, especially when the grapes are in bloom, forming clusters or setting fruit.

Results from this demonstration should be applicable to a very large surrounding area. The soil, widely typical, is class III, Ephrata Sandy loam, 20 to 30 inches deep, underlain with a calcified cobblestone subsoil.

The following table condenses some of the data:

Date sprinkled	Time (hours)	Pressure (pounds)	Number of sprinklers (size)	Current used (kw.-hr.)	Gallons (water)	Total equivalent rainfall	Penetration (inches)	Weather degrees F.
8-2-46	4.5	[1] 32	(13/64) 5 (4 1/2)	([2])	7,800	1.3	8.5	
8-9-46	7.0	38	5	36	16,100	2.31	12	95 clear.
8-16-46	5.5	36	5	12	12,600	1.7	12	96 hot.
8-22-46	4.0	32	5	16	9,100	1.16	8	92 clear.
8-29-46	5.0	34	5	20	11,300	1.55	12	80 cloudy.

[1] Pressure not constant due to adjusting pump and motor.
[2] Meter not installed for first irrigation.

From the foregoing summary it appears that the best rate of application would be approximately 1.5 inches of rainfall per irrigation. This could be reached with the installation used in the demonstration at 30 pounds pressure for about 5 hours. The discrepancy in the number of kilowatt-hours used and the number of gallons of water delivered at various times was due to adjusting of the pump and motor to obtain greater efficiency for the particular sprinkling set-up.

The sprinkler heads were placed 40 feet apart to insure complete coverage. The line was placed on the top of the posts in the grape row. The pipe was 2-inch galvanized portable, in 20-foot lengths with risers 6 inches high. A single-phase 3-horsepower motor was used and Columbia Irrigation District water was pumped from a riser. Single nozzle undertree sprinkler heads were used in applying the water. Apparently, a larger size nozzle could be used satisfactorily on this type of soil, applying the water in a shorter time without danger of puddling and reducing the rate or evaporation.

Since water was available for only one sprinkler line, no definite pattern was obtained. The main purpose of the demonstration was to determine the effect of sprinkler irrigation on the grape plant.

Against the Wind

Looking at this wealth of crop-insurance in a fallow strip subsurface tilled, are George Harmon (left), district conservationist of the Soil Conservation Service, and Roland Roberts, Nebraska farmer.

By A. E. McCLYMONDS

THE MOST effective, and cheapest, insurance against soil blowing is subsurface tillage (stubble mulch farming) combined with wind-strip cropping. This is the firm belief of farmers in the Horseshoe Bend area in western Nebraska, who have 90 percent of their cropland wind strip cropped, with most of it subsurface tilled. And they light no stubble fires, for burning is a thing of the past.

Bounded on the east by sharp-tipped Chimney Rock, and crowding against Wildcat Range on three sides, the 20,000 acres in Horseshoe Bend lie alongside the historic Oregon Trail.

Today, some of the best wheat in Nebraska is grown there. Wheat yield in the area averaged 40 bushels per acre this last season and the farmers say that the average would have been higher if there had been no hail damage a year ago. This average yield was obtained on land which, during the drought, blew away to plow depth, and even this year there was damage on unprotected land. This is quite in contrast to the period from 1931 to 1939 when not one profitable crop of wheat was raised, when wind-blown soil buried fences, and when large quantities of soil were lost forever.

Originally in good prairie grasses, much of the land was broken up for crops in 1910 to 1912.

NOTE.—The author is regional conservator, Soil Conservation Service, Lincoln, Nebr.

Wind strip cropping on the farm of Ben Roberts, Jr. Dark strips are growing wheat, light strips are fallow with good cover crop residue left on top by subsurface tillage operations. Contour strips in background are on the Frank Jessup farm.

Roland Roberts looks at crop residue still on surface in June, following wheat crop of year before. Outlying buttes of the Wildcat Range in background.

Early yields ran quite low, only 10 to 15 bushels.

In 1926 summer fallow was tried, using the moldboard plow and disk harrow, and yields climbed. The soil began to rip loose, as block farming left wide areas for the wind to take a good bite. The plow and disk harrow left the soil wide open to attack by the wind. It was also common practice for the farmers to burn off the stubble, thus destroying crop residues that would have helped hold the soil against the wind and at the same time increase its moisture absorbing capacity. These things, combined with drouth, caused many fields to be abandoned in the "dust bowl" of the 1930's.

Ben Roberts, who has lived in Horseshoe Bend since 1899, when he built a log cabin there, says, "In wet years we could get by with plowing, but most of the time stubble mulch farming and strip cropping are necessary if we are going to stay in the wheat-raising business. Conservation farming is the cheapest insurance we can carry."

Ben Roberts' sons, Bill, Roland, and Benny, Jr., who took over the farming when their father retired, are cooperators with the First Commissioner Soil Conservation District, as are 13 other farmers in Horseshoe Bend. Complete farm conservation plans have been developed for them with assistance from Soil Conservation Service technicians.

Some contour strip cropping is being used on Roland Roberts' farm. As to this, he comments, "Contour farming on the rolling land shows up well, especially in the yield of feed crops."

Flood control is a serious problem as water rushes down from the surrounding hills during heavy rains. Following farm conservation plans, water-spreading systems have been developed and diversion terraces built to lead the runoff into natural drainages which can carry it without damage.

About 400 acres of less-productive land have been seeded to crested wheatgrass.

According to George W. Harmond, district conservationist for the Soil Conservation Service in Scottsbluff, wind strips with alternate wheat and fallow, are from 8 to 18 rods wide and are crosswise to the prevailing winds. A good cover of crop residue is left on the surface of the fallow land by using one-ways, subsurface tillage tools such as rod weeders, and subsurface sweeps. These tools loosen the soil for seedbed, cut off weed roots, and do a tillage job; all beneath the crop residues. The residue, remaining on top, reduces tendency of the soil to blow, slows the escape of moisture from the surface, allows rainfall to be more quickly absorbed, provides protection for seedlings when they are young and delicate, and gradually decomposes to be mixed with the soil as humus.

Conservation farming shows its value even in good years. While there was no wind damage this year in Horseshoe Bend, several fields of wheat in a similar area over the hills to the west were blown out last winter and had to be replanted this spring. Crops were quite spotty there, but in Horseshoe Bend the yields were quite uniform.

Horseshoe Bend farmers of today have not forgotten the drouth years; but they are not afraid

(Continued on page 262)

REVIEWS

THE LAZY GARDENER. By William C. Pryor. Longmans, Green & Co. New York. 1946. 226 pp. Illustrations.

Most books on gardening are for postgraduates of trowel and spraygun. The Lazy Gardener, on the contrary, is for duffers. And there are an awful lot of duffers fussing around with shrubs and flowers and vegetables.

Gardens are farms in miniature. Town and suburban dwellers often graduate from an interest in gardening to an interest in land programs. That is one reason why Bill Pryor's book has importance to readers of this magazine.

Gardening's usual purposes are to feed, to tan, to toughen, to offer relaxation, and to make life and landscape beautiful. Bill Pryor furthers all these aims in The Lazy Gardener, with special emphasis on relaxation. His methods save soil, increase production, broaden the scope of personal enjoyment.

By following the author's intelligent albeit easy philosophy, enough minutes and hours can be salvaged from the muscle work to read his book and to ponder it—a pleasant and profitable pastime. The Lazy Gardener advocates deliberative activity. It takes some of the pressure off the boys with a hoe. As with trout fishing, some of gardening's highest dividends are the intangibles. This book invites a happy, adventurous approach while admitting the sweaty, toilsome aspects of the sport of growing onions and tomatoes. It makes clear the point that a "lazy" gardener is not a loafer per se but, rather, a wise, contemplative and superior artisan. It bursts wide open many of the orthodox, ritualistic "do's" and "don't's" of the usual manuals.

You can start reading anywhere, for there's a chuckle per page. The tone throughout is that of a friendly backfence neighbor, the kind who smokes a pipe and always has at the tip of his tongue a pertinent reminiscence or useful tip. Bill Pryor's fictional style carries over into the monthly "notes" which appear in sequential order in companionship with the first 12 chapters. For instance, the "Notes for January" are as chatty reading as the chapter "Why Bother with a Garden," which they follow.

The Lazy Gardner is a good ecologist who works always with nature. His common sense extends to the use of common names for plants in preference to the official latin. When Mrs. Coverleigh loftily inquires as to why he doesn't grow *Lilium giganteum* and *L. lancifolium*, gardener Bill wearily explains, "I'm keeping a garden for my own fun, not maintaining a horticultural museum." Bill likes mulches and leafmold. He stresses a good seedbed for vegetables but he finds many opportunities in his woods and elsewhere just to, more or less, let things go—with pleasant results. The author is a jealous guardian of soil, a conservationist by profession and by personal practice.

Jessie Robinson's delightful drawings fit the text. The jacket, reproducing in colors her sketch for chapter 2, Gardening in Bed, is calculated to catch the roving eye and stir the risibilities.—WELLINGTON BRINK.

TWO BLADES OF GRASS. BY T. SWAN HARDING, UNIVERSITY OF OKLAHOMA PRESS, NORMAN, 1947, 352 PP. ILLUS. PRICE $3.50.

The subtitle of this book is "A History of Scientific Development in the U. S. Department of Agriculture." The history is limited strictly to scientific development and research and does not go into the activities of the Extension Service, Agricultural Adjustment Agency, Bureau of Agricultural Economics, War Food Administration and similar programs with which a large part of the Department's efforts has been concerned in the past few years. This is a tremendous job which has needed doing for a long time. Apparently, it was waiting for a research man who was sufficiently articulate to accomplish the task. I am sure that no member of the Department's staff will read this book without an inward glow of satisfaction at being connected with an organization which has had such a tremendous impact on the agricultural economy of our country. At the same time one is brought to realize the extremely delicate balance among climate, plants, soil, diseases, insects, and animals and man under which most of our food and clothing and a large part of our shelter are produced. I do not believe that anyone can read this book and then ask the question which is asked too often: "When are you going to finish your research?" The author has taken particular pains to evaluate each research development. The total benefits are enormous in comparison with the cost. In other words the cost is so little in relation to the benefit that we cannot afford to be without it. Another slur that is often cast on the research work of the Department is that a project once started goes on forever. Several examples of projects which have been finished and closed are cited; for example, the project for the production of silk was closed in 1908 but almost had to be reopened by popular demand in 1941 when our relations with Japan became strained.

The first Federal appropriation for agriculture was $1,000 which was included in the bill for the 1840 census and established the Agricultural Division of the Patent Office. In 1847, just 100 years ago, the appropriation had increased to $3,500. The Agricultural Division continued in the Patent Office until 1862 when it was given independent bureau status with Isaac Newton as Commissioner. He was responsible for the statement about two blades of grass growing where but one grew before from which the title of this book is derived. In 1889 the Department was given full executive department status with a Cabinet officer instead of a Commissioner.

The greater part of the book is devoted to an account of the outstanding achievements of the various bureaus and the men who made them. Wiley's development of the first food and drug act, Howard's work with insects, Whitney's work with soils, Pinchot's work in forestry, Orton's work in plant breeding, and Dorset's development of hog cholera serum are only a very few of the many examples. In order to hold the volume to a reasonable size it must have been necessary to do a tremendous amount of screening. I was surprised to note that John R. Mahler, Samuel Fortier, and Lyman J. Briggs, to name a few omissions that come to mind, were screened out in view of some that were retained but it would be very difficult to get any two people to agree on where the line should be drawn.

The research and regulatory activities of some of the agencies which originated in the Department but have since been transferred elsewhere are discussed at some length. Among these are the Weather Bureau, Public Roads, Biological Survey, and Food and Drug Administration. The Hatch Act which aided the establishment and maintenance of the State agricultural experiment stations was passed in 1887. This led to the setting up of the Office of Experiment Stations in the Department. The Department and the stations working together have solved many problems which would have been difficult if not impossible for either to have solved alone. The need for working even more closely together has been emphasized by the Research and Marketing Act of 1946.

The subject of soil conservation is covered in considerable detail. The early work of Bennett in calling attention to the evils of soil erosion and eventually leading to the development of the Soil Conservation Service is reviewed. The author has a greater appreciation of the need of saving our land than many agricultural writers. The last sentence of his chapter on soil conservation illustrates his feeling on this subject. "Unless we retain the good soil and the great waters are conserved, the vine will not put forth branches nor yet will it bear fruit."—H. E. MIDDLETON.

VERSATILE PLANT.—Multiflora rose is coming into use as a hedge and living-fence plant. Planted at 1-foot intervals in a single row, the plant forms a dense, head-high shrubby fence that is easy to maintain, does not spread, and will confine livestock. Its wildlife value is not the least of its attributes. The Missouri Conservation Commission reports that Jack Stanford, Commission technician, walked along a multiflora rose planting this spring, "only a quarter of a mile in length, and observed 53 bobwhite quail feeding and chuckling under protective covering; 7 cottontail rabbits sunning themselves; 1 woodchuck excavating a fresh spring den; 1 red fox digging into some field mice burrows; and a number of field sparrows, meadow larks, and mocking birds criss-crossing the vegetation. The quail were feeding about 50 feet from where the fox was digging and a rabbit was resting a few feet from the last-destroyed mouse nest."

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(*Continued from page 260*)

to meet similar conditions, should they come again. They know much soil moisture is being stored in these years of generous rainfall and that the soil is being anchored against blowing.

They will readily tell you that it does take a little more time and trouble to do a good job of conservation farming, but that it pays off in wheat harvest and also provides soil security, a cheap but very practical form of insurance.

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